WHAT IS CLAIMED IS:

1. An optical access system that connects subscriber premises with a central office by using optical communications techniques, the system comprising:

(a) a slave device identified by a slave device number, comprising:

a send packet buffer that stores packets to be sent,

a sending-end write controller that writes a packet in said send packet buffer,

a capacity monitor that watches usage of said send packet buffer and outputs a capacity indicator representing the amount of unused memory space in said send packet buffer,

an upstream frame timing controller that produces a frame signal representing a bandwidth allocated to said slave device for upstream data transmission, the frame signal being active during a period corresponding to a maximum frame size, and

a sending-end read controller that reads the packets out of said send packet buffer when the frame signal is active and the capacity indicator indicates presence of packets pending in said send packet buffer, wherein said sending-end read controller suspends said reading of packets when the maximum frame size is reached and resumes the suspended reading next time the frame

signal becomes active; and

(b) a master device comprising:

a receive packet buffer that stores packets received from the slave device in a memory space that is associated with the slave device number of the sending slave device,

a delimiter detector that produces a start signal upon detection of a start delimiter of a received packet, and an end signal upon detection of an end delimiter of the received packet,

a receiving-end write controller that starts writing the received packet into said receive packet buffer upon receipt of the start signal from said delimiter detector and stops writing the received packet into said receive packet buffer upon receipt of the end signal from said delimiter detector,

a read request unit that issues a read request for the received packet upon issuance of the end signal, and

a receiving-end read controller that reads, in response to the read request, the received packet out of the memory space of said receive packet buffer by giving a read address that includes the slave device number of said slave device.

2. A slave device located in a subscriber's premises for use in an optical access system, the slave device comprising:

a send packet buffer that stores packets to be sent;

a sending-end write controller that writes a packet in said send packet buffer;

a capacity monitor that watches usage of said send packet buffer and outputs a capacity indicator representing the amount of unused memory space in said send packet buffer;

an upstream frame timing controller that produces a frame signal representing a bandwidth allocated to said slave device for upstream data transmission, the frame signal being active during a period corresponding to a maximum frame size; and

a sending-end read controller that reads the packets out of said send packet buffer when the frame signal is active and the capacity indicator indicates presence of packets pending in said send packet buffer, wherein said sending-end read controller suspends said reading of packets when the maximum frame size is reached and resumes the suspended reading next time the frame signal becomes active.

3. A master device located in a central office for use in an optical access system, the master device comprising:

a receive packet buffer that stores packets received from a slave device in a memory space that is

associated with a slave device number of the sending slave device;

a delimiter detector that produces a start signal upon detection of a start delimiter of a received packet, and an end signal upon detection of an end delimiter of the received packet;

a receiving-end write controller that starts writing the received packet into said receive packet buffer upon receipt of the start signal from said delimiter detector and stops writing the received packet into said receive packet buffer upon receipt of the end signal from said delimiter detector;

a read request unit that issues a read request for the received packet upon issuance of the end signal; and

a receiving-end read controller that reads, in response to the read request, the received packet out of the memory space of said receive packet buffer by giving a read address that includes the slave device number of said slave device.

4. An optical access system that connects subscriber premises with a central office by using optical communications techniques, the system comprising:

(a) a slave device comprising:

a send packet buffer that stores packets to be sent,

a sending-end write controller that writes a

packet in said send packet buffer,

a remaining frame space counter that calculates remaining frame space by subtracting the amount of packets in a current frame from a given frame size, and

a read controller that, when the remaining frame space is insufficient for a next pending packet, searches said send packet buffer to identify a packet that fits in the remaining frame space and has no order-sensitive relationship with the next pending packet, and reads the identified packet out of said send packet buffer earlier than the next pending packet; and

(b) a master device that receives upstream data from the slave device and sends downstream data to the slave device.

5. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Source Address field values of layer-2 MAC frame header.

6. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Destination Address field values of layer-2 MAC frame header.

7. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Priority values in TAG field of layer-2 MAC frame header.

8. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of VLAN ID (VID) values in TAG field of layer-2 MAC frame header.

9. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Individual/Group (I/G) bit values of layer-2 MAC frame header.

10. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Type field values of layer-2 MAC frame header.

11. The optical access system according to

claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Destination IP Address field values of layer-3 IP header.

12. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Protocol field values of layer-3 IP header.

13. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of Type of Service (TOS) field values of layer-3 IP header.

14. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet is different from the next pending packet in terms of both Source Address field values and Type field values of layer-2 MAC frame header.

15. The optical access system according to claim 4, wherein said read controller identifies a packet as having no order-sensitive relationship when said packet

is different from the next pending packet in terms of both Destination IP Address field values and Protocol field values of layer-3 IP header.

16. A slave device located in a subscriber's premises for use in an optical access system, the slave device comprising:

a send packet buffer that stores packets to be sent;

a sending-end write controller that writes a packet in said send packet buffer,

a remaining frame space counter that calculates remaining frame space by subtracting the amount of packets in a current frame from a given frame size; and

a read controller that, when the remaining frame space is insufficient for a next pending packet, searches said send packet buffer to identify a packet that fits in the remaining frame space and has no order-sensitive relationship with the next pending packet, and reads the identified packet out of said send packet buffer earlier than the next pending packet.